

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT****ENGINEERING AND COMPLIANCE****APPLICATION PROCESSING AND CALCULATIONS**

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APPL. NO.

544128 & 544136

DATE:

May 31, 2013

PROCESSED BY

S. JIANG

CHECKED BY

D. GORDON

EVALUATION REPORT FOR PERMIT TO CONSTRUCT/OPERATE

Applicant's Name: FREE FLOW PACKAGING INTERNATIONAL, INC. Facility ID: 43605

Mailing Address: 1090 MILLS WAY
REDWOOD CITY, CA 94063

Equipment Location: 6195 E. RANDOLPH STREET
CITY OF COMMERCE, CA 90040 - 3513

EQUIPMENT DESCRIPTION**Appl. No. 544128 – Burner Modification for the Parker Boiler (P/O F16269 A/N: 328530)**

BOILER, PARKER BOILER CO., WATER TUBE, MODEL NO. 115L, 4,830,000 BTU PER HOUR, WITH 12 LOW NOX BURNERS, PARKER BOILER CO., **MODEL NO. PB36LN**, NATURAL GAS-FIRED, PREMIX METAL FIBER TYPE, AND A 2 HP ASSISTED AIR BLOWER.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITIONS AT ALL TIMES.
[RULE 204]
3. THIS EQUIPMENT SHALL EMIT NO MORE THAN 12 PPM OF OXIDES OF NITROGEN (NOX), CALCULATED AS NO₂, AND NO MORE THAN 100 PPM OF CARBON MONOXIDE (CO), ALL MEASURED BY VOLUME ON A DRY BASIS AT 3% O₂.
[RULE 1146.1; RULE 1303 (A)(1)-BACT]
4. THIS EQUIPMENT SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF RULE 1146.1.
[RULE 1146.1]

Periodic Monitoring:

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5. THE OPERATOR SHALL DETERMINE COMPLIANCE WITH THE CO EMISSION LIMIT(S) BY CONDUCTING A TEST AT LEAST ONCE EVERY FIVE YEARS USING A PORTABLE ANALYZER AND AQMD-APPROVED TEST METHOD OR, IF NOT AVAILABLE, A NON-AQMD APPROVED TEST METHOD. THE TEST SHALL BE CONDUCTED WHEN THE EQUIPMENT IS OPERATING UNDER NORMAL CONDITIONS TO DEMONSTRATE COMPLIANCE WITH RULE 1146.1 CONCENTRATION LIMIT. THE OPERATOR SHALL COMPLY WITH ALL GENERAL TESTING, REPORTING, AND RECORDKEEPING REQUIREMENTS IN SECTIONS E AND K OF THIS PERMIT.
[RULE 3004 (A)(4)]
6. THE OPERATOR SHALL DETERMINE COMPLIANCE WITH THE NOX EMISSION LIMIT(S) BY CONDUCTING A TEST AT LEAST ONCE EVERY FIVE YEARS USING A PORTABLE ANALYZER AND AQMD-APPROVED TEST METHOD OR, IF NOT AVAILABLE, A NON-AQMD APPROVED TEST METHOD. THE TEST SHALL BE CONDUCTED WHEN THE EQUIPMENT IS OPERATING UNDER NORMAL CONDITIONS TO DEMONSTRATE COMPLIANCE WITH RULE 1146.1 CONCENTRATION LIMIT. THE OPERATOR SHALL COMPLY WITH ALL GENERAL TESTING, REPORTING, AND RECORDKEEPING REQUIREMENTS IN SECTIONS E AND K OF THIS PERMIT.
[RULE 3004 (A)(4)]
7. THE OWNER OR OPERATOR OF THIS EQUIPMENT SHALL CONDUCT SOURCE TESTS UNDER THE FOLLOWING CONDITIONS:
 - A. THE SOURCE TESTS SHALL BE CONDUCTED NO LATER THAN 180 DAYS AFTER THE INITIAL START-UP OF THIS EQUIPMENT UNLESS OTHERWISE APPROVED IN WRITING BY THE DISTRICT.
 - B. THE SOURCE TESTS SHALL BE CONDUCTED ONCE EVERY FIVE YEARS.
 - C. THE SOURCE TESTS SHALL BE CONDUCTED TO VERIFY COMPLIANCE WITH THE NOX AND CO EMISSION LIMITS SPECIFIED IN CONDITION NO. 3, ABOVE.
 - D. SOURCE TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH SCAQMD METHOD 100.1.
 - E. THE TESTS SHALL BE CONDUCTED WHILE THE BOILER IS OPERATING AT MAXIMUM, MINIMUM AND NORMAL FIRING RATES. THE SAMPLING TIMES SHALL BE AT LEAST 15 CONSECUTIVE MINUTES FOR MAXIMUM AND MINIMUM LOADS AND AT LEAST 30 CONSECUTIVE MINUTES FOR NORMAL OPERATING LOAD.

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- F. TWO COMPLETE COPIES OF THE SOURCE TEST REPORTS SHALL BE SUBMITTED TO THE DISTRICT (ADDRESSED TO SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, P.O. BOX 4941, DIAMOND BAR, CA 91765) WITHIN 45 DAYS AFTER THE SOURCE TESTING DATE. THE SOURCE TEST REPORT SHALL INCLUDE, BUT MAY NOT BE LIMITED TO, EMISSIONS RATE IN POUNDS PER HOUR AND CONCENTRATION IN PPMV AT THE OUTLET OF THE BOILER.
- G. A TESTING LABORATORY CERTIFIED BY THE CALIFORNIA AIR RESOURCES BOARD IN THE REQUIRED TEST METHODS FOR CRITERIA POLLUTANTS TO BE MEASURED, AND IN COMPLIANCE WITH DISTRICT RULE 304 (NO CONFLICT OF INTEREST) SHALL CONDUCT THE TEST.
- H. SAMPLING FACILITIES SHALL COMPLY WITH THE DISTRICT GUIDELINES FOR CONSTRUCTION OF SAMPLING AND TESTING FACILITIES, PURSUANT TO RULE 217.

[RULE 1146.1; RULE 1303(A)(1)-BACT; RULE 3004 (A)(4)]

8. THE OWNER OF THIS EQUIPMENT SHALL CHECK NOX EMISSIONS WITH A PORTABLE NOX, CO AND OXYGEN ANALYZER ACCORDING TO THE FOLLOWING CONDITIONS:
- A. THE OWNER OF THIS EQUIPMENT SHALL CHECK NOX EMISSIONS AT LEAST QUARTERLY OR EVERY 2,000 UNIT OPERATING HOURS, WHICHEVER OCCURS LATER. IF THIS EQUIPMENT IS IN COMPLIANCE FOR FOUR CONSECUTIVE REQUIRED EMISSION CHECKS, WITHOUT ANY ADJUSTMENTS TO THE OXYGEN SENSOR SET POINTS, THEN THIS EQUIPMENT MAY BE CHECKED SEMI-ANNUALLY OR EVERY 4,000 UNIT OPERATING HOURS, WHICHEVER OCCURS LATER, UNTIL THERE IS AN EMISSION CHECK INDICATING NONCOMPLIANCE.
- B. THE OWNER OF THIS EQUIPMENT SHALL CHECK NOX EMISSIONS WITH A PORTABLE NOX, CO AND OXYGEN ANALYZER ACCORDING TO THE PROTOCOL FOR THE PERIODIC MONITORING OF NITROGEN OXIDES, CARBON MONOXIDE, AND OXYGEN FROM COMBUSTION SOURCES SUBJECT TO RULE 1146.1.
- C. RECORDS OF ALL MONITORING DATA SHALL BE MAINTAINED FOR A ROLLING TWELVE MONTH PERIOD OF FIVE YEARS AND SHALL BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.
- D. THE PORTABLE ANALYZER TESTS SHALL ONLY BE CONDUCTED BY A PERSON WHO HAS COMPLETED AN APPROPRIATE DISTRICT-APPROVED TRAINING PROGRAM IN THE OPERATION OF PORTABLE ANALYZERS AND HAS RECEIVED A CERTIFICATION ISSUED BY THE DISTRICT.

[RULE 1146.1; RULE 1303(A)(1)-BACT; RULE 3004 (A)(4)]

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Emissions And Requirements:

9. THIS EQUIPMENT IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

CO: 2000 PPMV, RULE 407

CO: 400 PPMV, RULE 1146.1

PM: 0.1 GR/SCF, RULE 409

PM: RULE 404, SEE APPENDIX B FOR EMISSION LIMITS

NOX: 12 PPMV, RULE 1146.1

Appl. No. 544136 – Minor Title V Facility Permit Revision

Revision of Title V Facility Permit per Rule 301(m)(7).

BACKGROUND/HISTORY

Free Flow Packaging International Inc. (“Free Flow”) is located in City of Commerce, California. Free Flow processes recycled polystyrene foam products into polystyrene foam packaging materials (loose fills). Free Flow currently operates one polystyrene foam packaging manufacturing system, two boilers and one blowing agent storage tank. The polystyrene foam packaging manufacturing system consists of two extruders, two 1st expanders and one 2nd expander, intermediate storage room, hot room, two final storage rooms, and associated conveyors and hoppers. The VOC emissions from the polystyrene foam packaging manufacturing system are subject to Rule 1175 and they are being controlled by a regenerative thermal oxidizer.

Free Flow facility type:

<u>RECLAIM</u>		<u>Title V</u>
SOx	NOx	
No	No	Yes

The existing Free Flow Title V Permit will expire on July 11, 2016.

On October 19, 2012, Free Flow submitted the following permit applications indicated as follows:

<u>Appl. No.</u>	<u>Type</u>	<u>Previous P/O</u>	<u>Equipment</u>	<u>Fee Sch.</u>	<u>Higher Fee?</u>
544128	P/C-Mod.	F16269	4.83 MMBtu/hr Boiler	Sch. B	No
544136	Plan	N/A	N/A	Title V Rev.	N/A

Appl. No. 544128 is submitted as a burner modification application for the Parker boiler. The boiler is 115-HP water-tube atmospheric unit that subject Rule 1146.1. Rule 1146.1 (c)(2) requires the operator to submit an application for the boiler to meet with a new NOx emission limit of 12 ppm @ 3% O₂ by January 1, 2013 and must be in full compliance with the NOx emission limit by January 1, 2014. Free Flow plans to replace the existing burner with a Rule 1146.1 compliance burner.

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Appl. No. 544136 is submitted as a plan application for the minor revision of the Title V permit as specified in Rule 301.

PROCESS DESCRIPTION

This boiler is one of the two boilers at Free Flow facility that are used to generate steam/heat for the polystyrene foam “loose fill” manufacturing process. The boiler is an atmospheric unit relies upon the negative draft in the chimney to draw the products of combustion out. The existing burner will be replaced with a new Parker PB36LN low NO_x burner system. The manufacturer guarantees the NO_x emission level to be lower than 12 ppm @3% O₂.

EMISSION CALCULATIONSData

Operating Schedule: 24 hrs/day, 7 days/week, 52 weeks/yr
 Fuel used: Natural Gas
 Natural Gas F-factor: 8,710 dscf/MMBtu @ 68°F and 29.92 in Hg
 Natural Gas Higher Heating Value: 1,050 Btu/scf (Regulation XX, Rule 2012, Table 3-D)
 Maximum Load: 100%

CRITERIA POLLUTANTSEmission Factors

$$\text{Emission}_{\text{ROG,SOX,PM10}} (\text{lb/MMBtu}) = EF_{\text{ROG,SOX,PM10}} \left(\frac{\text{lb}}{\text{MMscf}} \right) \times \frac{1 \text{MMscf}}{1050 \text{MMBtu}}$$

$$\text{Emission}_{\text{NOX, CO}} (\text{lb/MMBtu}) = \frac{MW \times N_{@3\%O_2} \times \text{ppm}}{H}$$

Where: H= Heating value of fuel (Btu/lb) (for natural gas= 23,440 btu/lb)

N_{@3%O₂}= 0.618 mole of dry gas per lb of natural gas.

MW= Molecular weight (lb/lb-mole)

Pollutant	Emission Factor (from manufacturer) ppmV @ 3% O ₂	Emission Factor (AQMD Default) lb/mmscf	Emission Factor (for this report) lb/MMBtu
VOC	-	5.5	0.00524
SO _x	-	0.6	0.000571
PM ₁₀	-	7.6	0.00724
NO _x	12	-	0.0146
CO	100	-	0.0738

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AQMD Default emission factors for a natural gas fired boiler were taken from “General Instruction Book for the AQMD 2006-2007 Annual Emission Reporting Program”, Appendix A- Table 1):

Burner rating: 4.83 MMBTU/hr

Operating Schedule: 24 hrs/day; 7 days/week; 52 weeks/yr

Criteria Pollutants Emission Summary

A/N 544128		Hourly (lbs/hr)	Daily (lbs/day)	Annually (lbs/yr)	30 day ave. (lbs/day)	30 day NSR (lbs/day)
R1=R2	VOC	0.0253	0.61	221.02	0.61	1
R1=R2	SO _x	0.0028	0.07	24.11	0.07	0
R1=R2	PM ₁₀	0.0350	0.84	305.41	0.84	1
R1=R2	NO _x	0.0703	1.69	614.09	1.69	2
R1=R2	CO	0.3566	8.56	3,114.93	8.56	9

Hourly (lbs/hr) = (Emission Factor, lbs/MMBtu) (4.83 MMBtu/hr)

Daily (lbs/day) = (Hourly, lbs/hr) (24 hrs/day)

Annually (lbs/yr) = (daily lbs/day) (7 days/wk) (52 wks/yr)

GHG EMISSIONSEmission Factors

<u>GHG</u>	<u>Emission Factor (lb/MMscf)</u>
CO ₂	120,000
CH ₄	2.3
N ₂ O	2.2

Emission factors are obtained from AP42 Table 1.4-2 Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion.

Burner rating: 4.83 MMBTU/hr

Operating Schedule: 24 hrs/day; 7 days/week; 52 weeks/yr

GHG Emission Summary

A/N 544128		Mass-Based Emissions (lb/hr) (TPY)		CO ₂ e-Based Emissions (TPY CO ₂ e)
R1=R2	CO ₂	5.52E+02	1.69E+04	1.69E+04
R1=R2	N ₂ O	1.06E-02	3.24E-01	1.01E+02
R1=R2	CH ₄	1.01E-02	3.10E-01	6.52E+00
R1=R2	GHG	5.52E+02	1.69E+04	1.70E+04

TPY = (4.83 MMBtu/hr) (24 hr/day) (365 day/yr) (Emission Factor) / (1050 MMscf/MMBtu) / (2000 lb/ton)

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GHG GWP: $\text{CO}_2 = 1$
 $\text{N}_2\text{O} = 310$
 $\text{CH}_4 = 21$

RULES AND REGULATIONS EVALUATION**40 CFR Standards of Performance for Small Industrial-Commercial-Institutional Steam
Subpart Dc: Generating Units****§ 60.40c Applicability and delegation of authority.**

The subject boiler is rated at 4.83 MMBtu/hr (less than 10 MMBtu/hr); thus, this boiler is not subject to this rule.

Rule 212: Standards for Approving Permits

Based on a review of the Google maps, it appears that the Bell Gardens High School property is located to the south of the facility across Randolph Street. However, since there is no emission increase with this modification, a Public Notice is not required.

Rule 401: Visible Emissions – Compliance is expected from well maintained and properly operated equipment.**Rule 402: Public Nuisance – With proper operation and maintenance, the equipment is not likely to create a public nuisance.****Rule 1146.1: Emissions of NO_x from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters:**

(c)(2) The boiler is an atmospheric unit; thus, it is subject NO_x emission limit of 12 ppmv @ 3% O_2 . This section of the rule requires permit application for the burner modification project to be submitted before January 1, 2013; since this application was validated on October 19, 2012, compliance is achieved.

(c)(4) The manufacturer guarantees the unit will achieve 100 ppmv CO @ 3% O_2 , which is lower than the 400 ppmv CO requirements of the rule; therefore, the project will comply with the emission.

The operator will conduct a source test to verify compliance with this rule.

Rule 1303: BACT

Following are BACT guidelines for the boiler:

Subcategory/ Rating/Size	Criteria Pollutants				
	VOC	NO_x	SO_x	CO	PM_{10}
Natural Gas or Propane Fired, < 20 MMBtu/HR		≤ 12 ppmv dry corrected to 3% O_2 (10-20-2000)	Natural Gas (10-20-2000)	≤ 50 ppmv for firetube type, ≤ 100 ppmv for watertube type, dry corrected to 3% O_2 (04-10-98)	Natural Gas (04-10-98)

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NO_x emissions - The manufacturer guarantees the unit will achieve 12 ppmv NO_x @ 3% O₂. Compliance with BACT is expected.

CO emissions – The boiler is a water-tube type. The manufacturer guarantees the unit will achieve 100 ppmv CO @ 3% O₂. Compliance with BACT is expected.

A source test will be performed to verify compliance with this rule.

Rule 1303(b)(1): **Modeling:** The NO_x, CO and PM₁₀ emissions from this equipment are below the rule limits (specified in the table A1). Therefore, no further screening analysis is required.

	Actual emission for the boiler (lb/hr)	Allowable Emission (lb/hr)
NO _x	0.070	0.31
CO	0.357	17.1
PM ₁₀	0.035	1.9

Rule 1303(b)(2): **Offsets:** There are no emission increase associated with the proposed modification. No emission offset is required for the burner replacement project.

Reg XXX: **Title V Permit**

Free Flow (Facility ID: 43605) is a Title V facility. The Title V Permit for the facility was renewed on July 12, 2011 and expired on July 11, 2016.

Application no. 544128 is to replace the burner per Rule 1146.1 (c)(2). According to Rule 1146.1 (c)(2), Free Flow shall come into compliance with NO_x emission limit of 12 ppm or less on or before January 1, 2014. No emission increase is expected for this application. Therefore, application no. 544128 is considered Minor Permit Revisions of Title V Facility Permit and it is subject to a 45-day EPA review prior to final revision of the Title V Facility Permit (Application No. 544136).

CONCLUSION AND RECOMMENDATIONS

Based on this evaluation, it is expected that the subject equipment will be operated in compliance with all applicable District Rules and Regulations. The Permit to Construct/Operate is recommended to be issued.